

APRIL/MAY 2023

GCH13/DCH13 — PHYSICAL CHEMISTRY-I

Time : Three hours

Maximum : 75 marks

SECTION A — (10 × 2 = 20 marks)

Answer ALL questions.

1. Define fugacity.
2. What are partial molar properties?
3. What are reactions?
4. Give the Gibbs phase rule equation and explain the terms involved in it.
5. Define Zeta potential.
6. Write notes on critical micelle concentration.
7. Calculate the ionic strength of 0.1M KCl solution.
8. Write the Taft equation and explain the terms involved in it.
9. Give example for acid and base catalysed reactions.
10. Give two examples for enzyme catalysed reactions.

SECTION B — ($5 \times 5 = 25$ marks)

Answer ALL questions.

11. (a) Discuss the variation of chemical potential with temperature and pressure.

Or

- (b) How to determine fugacity using graphical method?

12. (a) Draw and briefly explain the phase diagram of $\text{NaCl-H}_2\text{O}$ system.

Or

- (b) Construct and explain the phase diagram of $\text{AcOH-CHCl}_3\text{-H}_2\text{O}$ system.

13. (a) Write a note on protective colloids.

Or

- (b) Explain about the sedimentation and streaming potentials.

14. (a) Elaborate the significance of enthalpy and entropy of activation in a chemical reaction.

Or

- (b) Analyse the influence of ionic strength on the rate of the chemical reactions.

15. (a) Explain the different factors influencing the enzyme catalysed reactions.

Or

- (b) Distinguish between competitive and non-competitive reaction.

SECTION C — ($3 \times 10 = 30$ marks)

Answer any THREE questions.

16. Explain the determination of activity and activity coefficient by EMF method.

17. Discuss the phase diagram for Sodium chloride – Sodium Sulphate – Water system.

18. Explain the following

(a) Surfactants

(b) Micellization

19. Explain the Postulates of ARR theory and derive the Eyring's equation.

20. Illustrate in detail about the inhibition of enzyme catalysed reactions.